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(54) **UPRIGHT TYPE VACUUM CLEANER HAVING MULTI JOINT PORTION**

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A47L 9/32 (2006.01)

(52) **U.S. Cl.** **15/410**; 15/350

(58) **Field of Classification Search** 15/350, 15/410; 16/429, 900, 324, 326, 352; *A47L 9/32*
See application file for complete search history.

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(57) **ABSTRACT**

An upright type vacuum cleaner is provided that includes a main body containing a filtering device that filters out foreign materials entrained in sucked air, a suction nozzle device connected to a lower portion of the main body to be pivoted on a first joint portion, so as to suck the air with the entrained foreign materials and guide the sucked air into the main body, and a handle that is connected to an upper portion of the main body to be pivoted on a second joint portion. The handle is provided with a third joint portion in the middle of the handle so that the handle may be folded at certain angles, and grasped by a user in use. The main body, the suction nozzle device, and the handle are connected to one another through the three joint portions in various configurations and at different angles so that users having various physical conditions may conveniently use the vacuum cleaner in various manners.

19 Claims, 10 Drawing Sheets

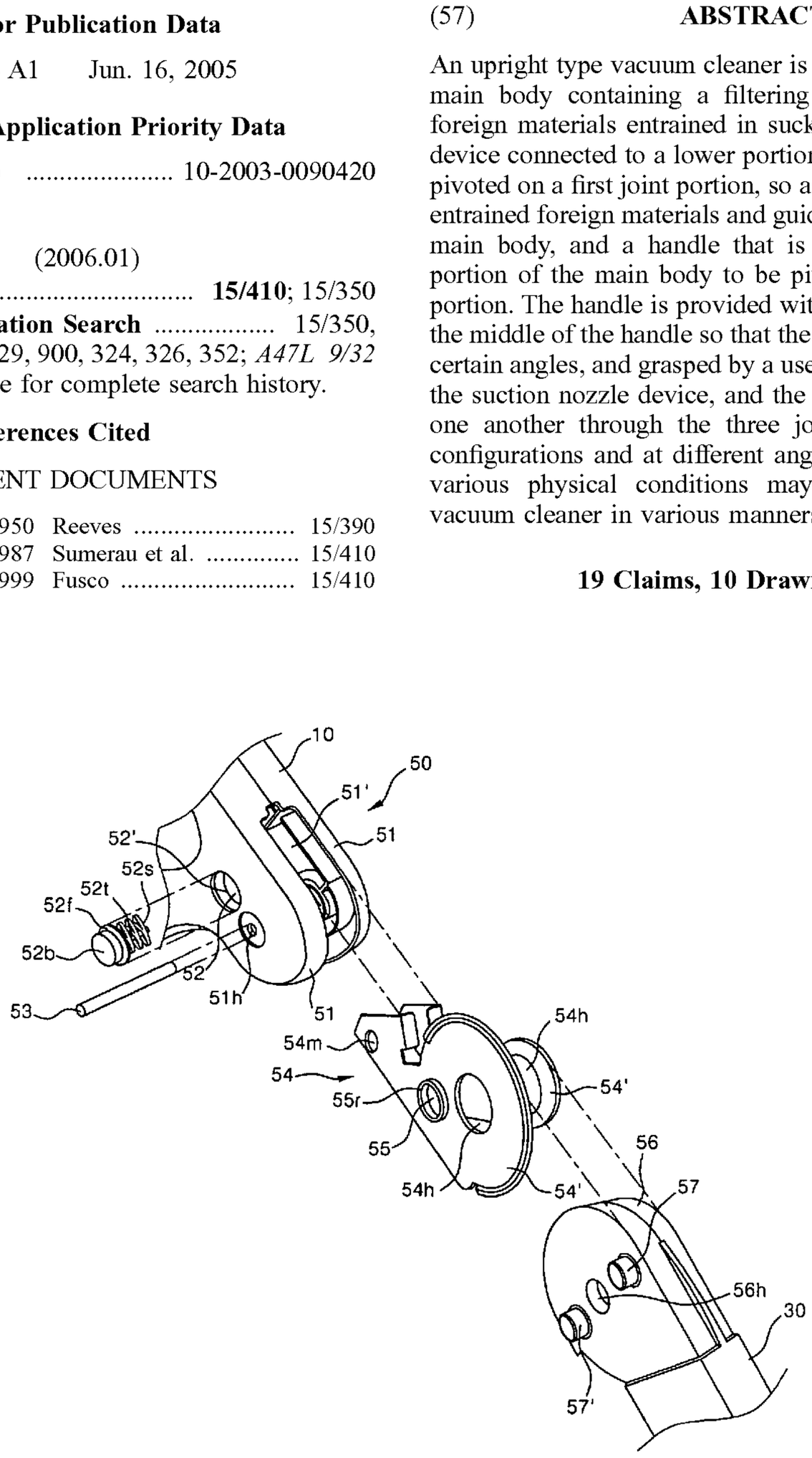

FIG. 1

Prior-Art

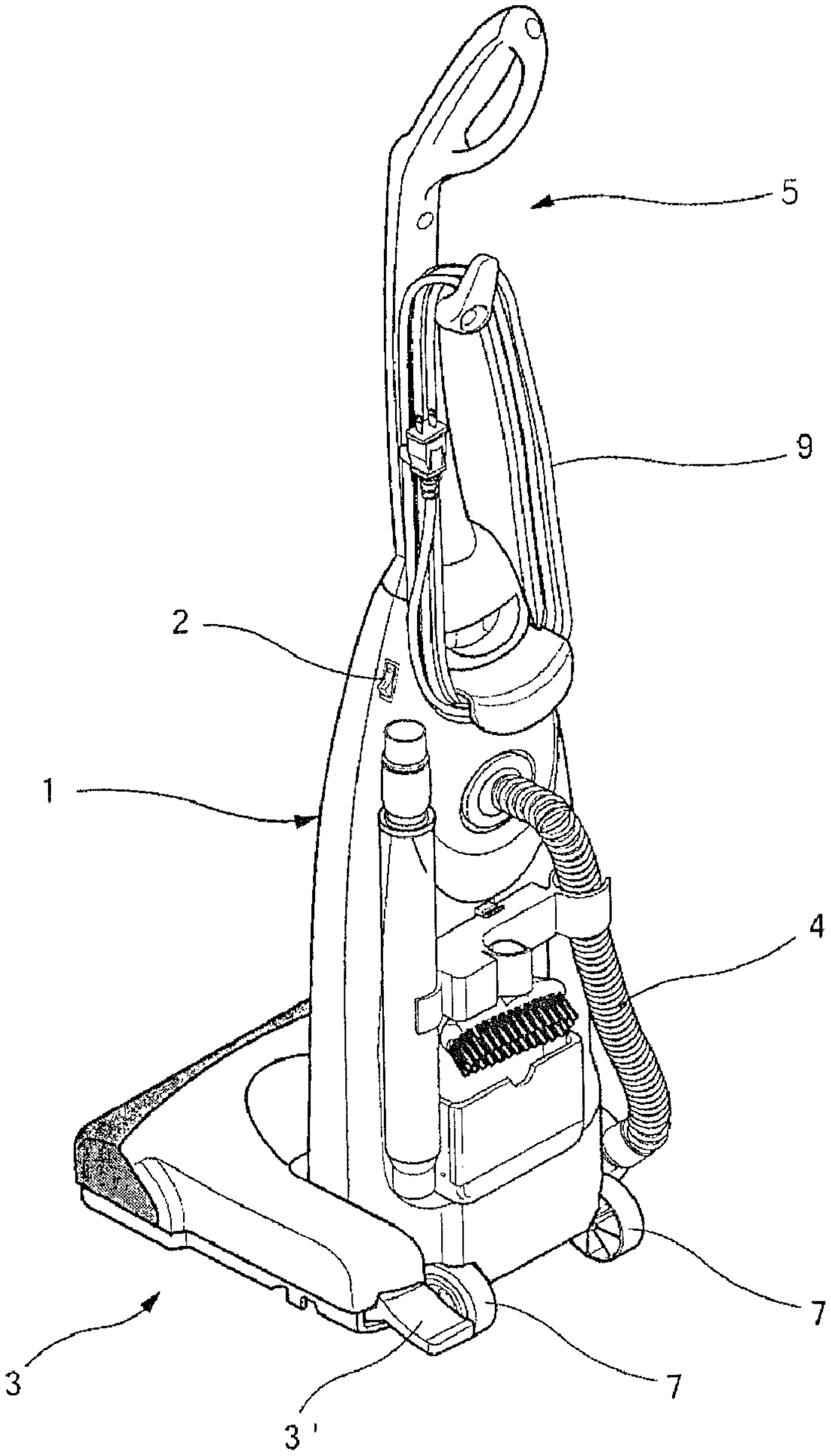

FIG. 2

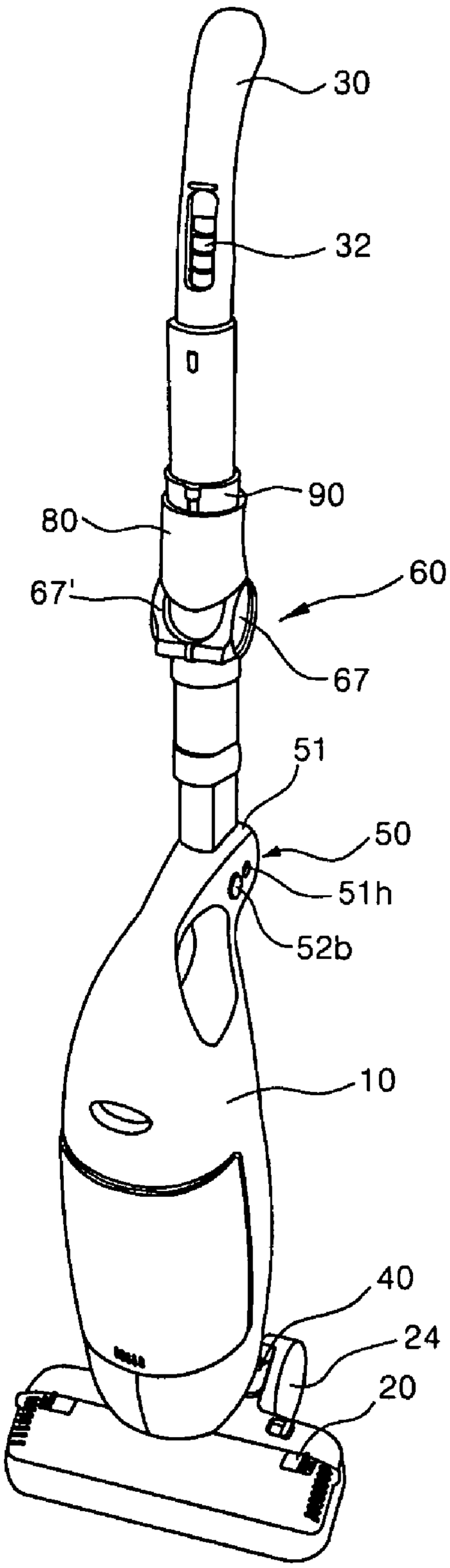

FIG. 3

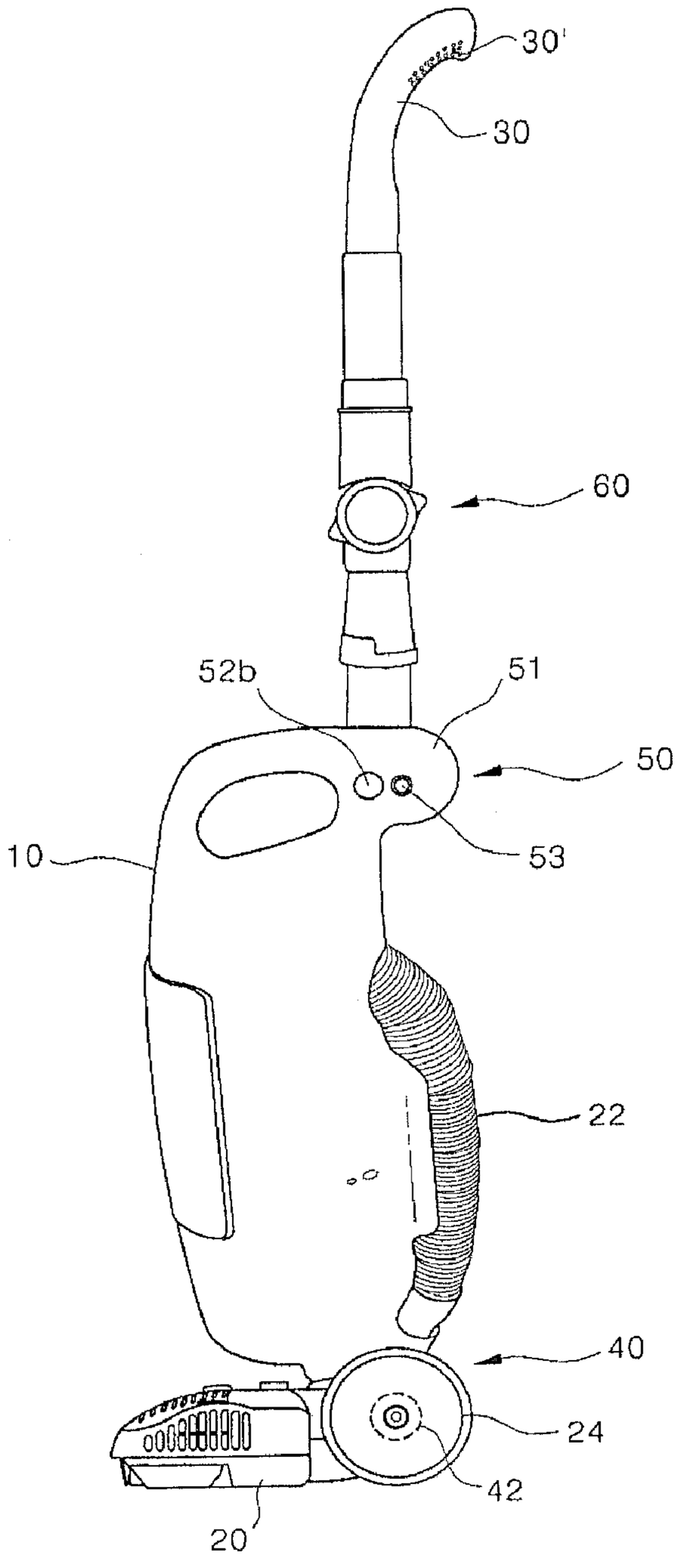

FIG. 4

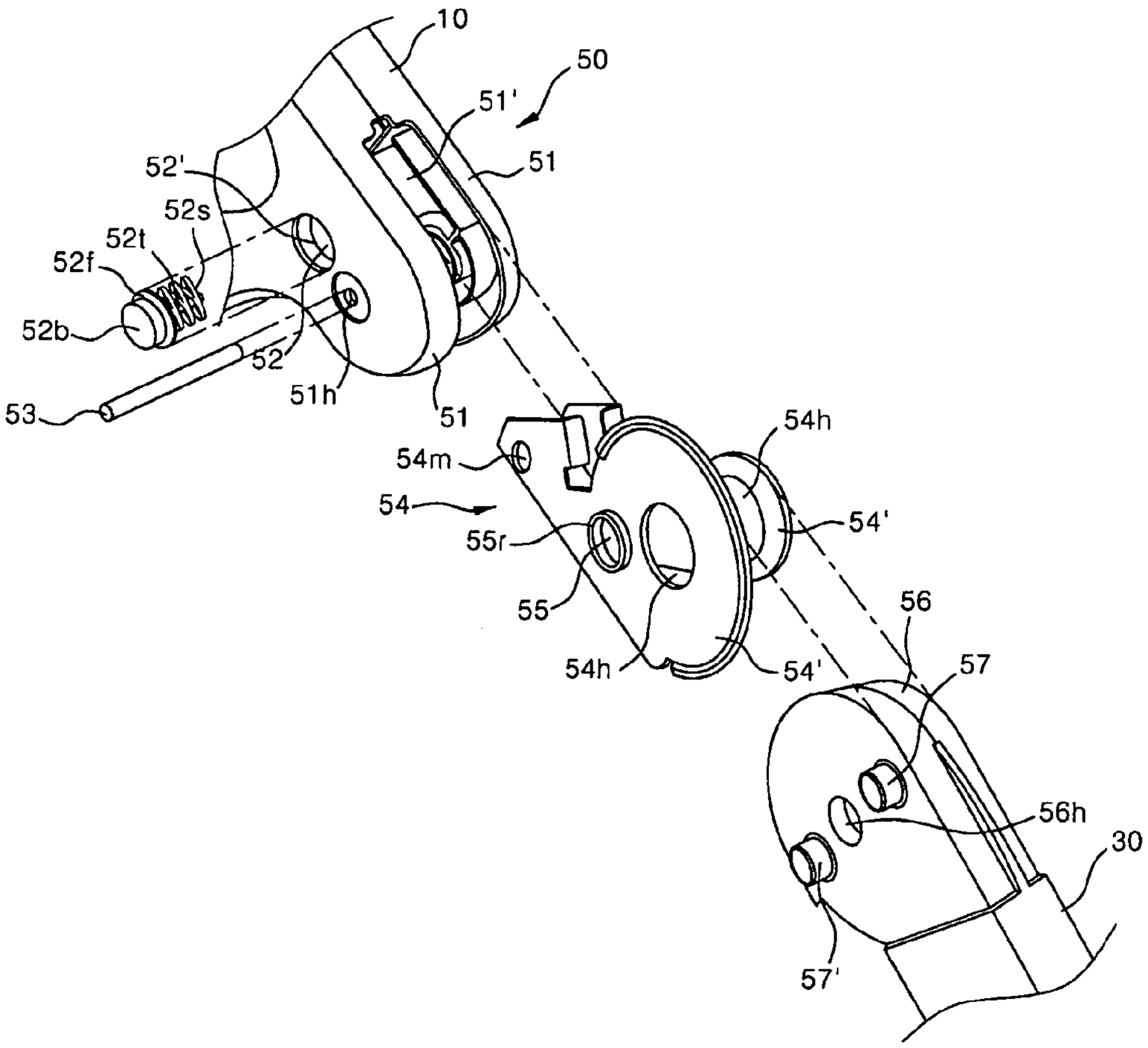
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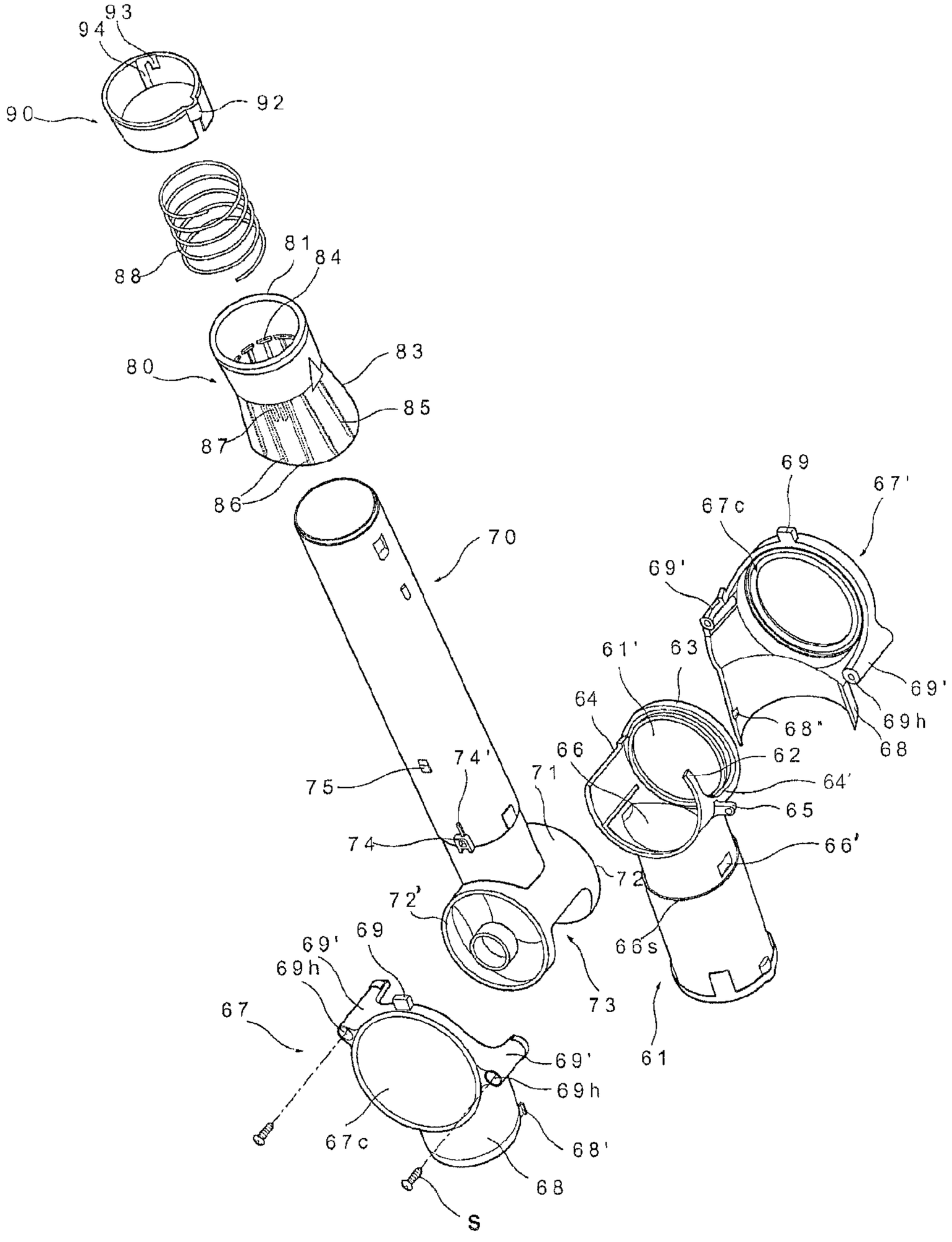
FIG. 5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67c
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69h
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FIG. 6a

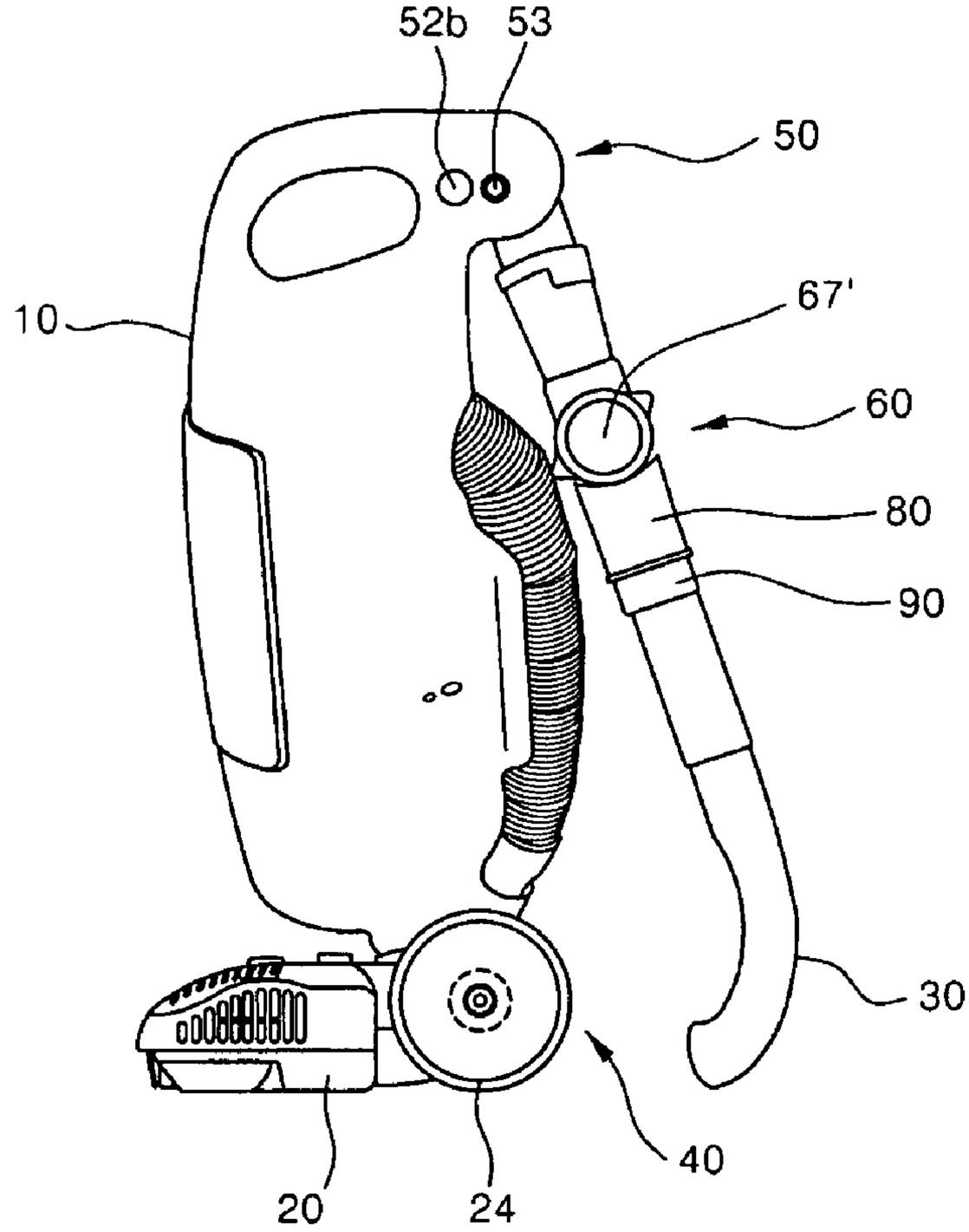


FIG. 6b

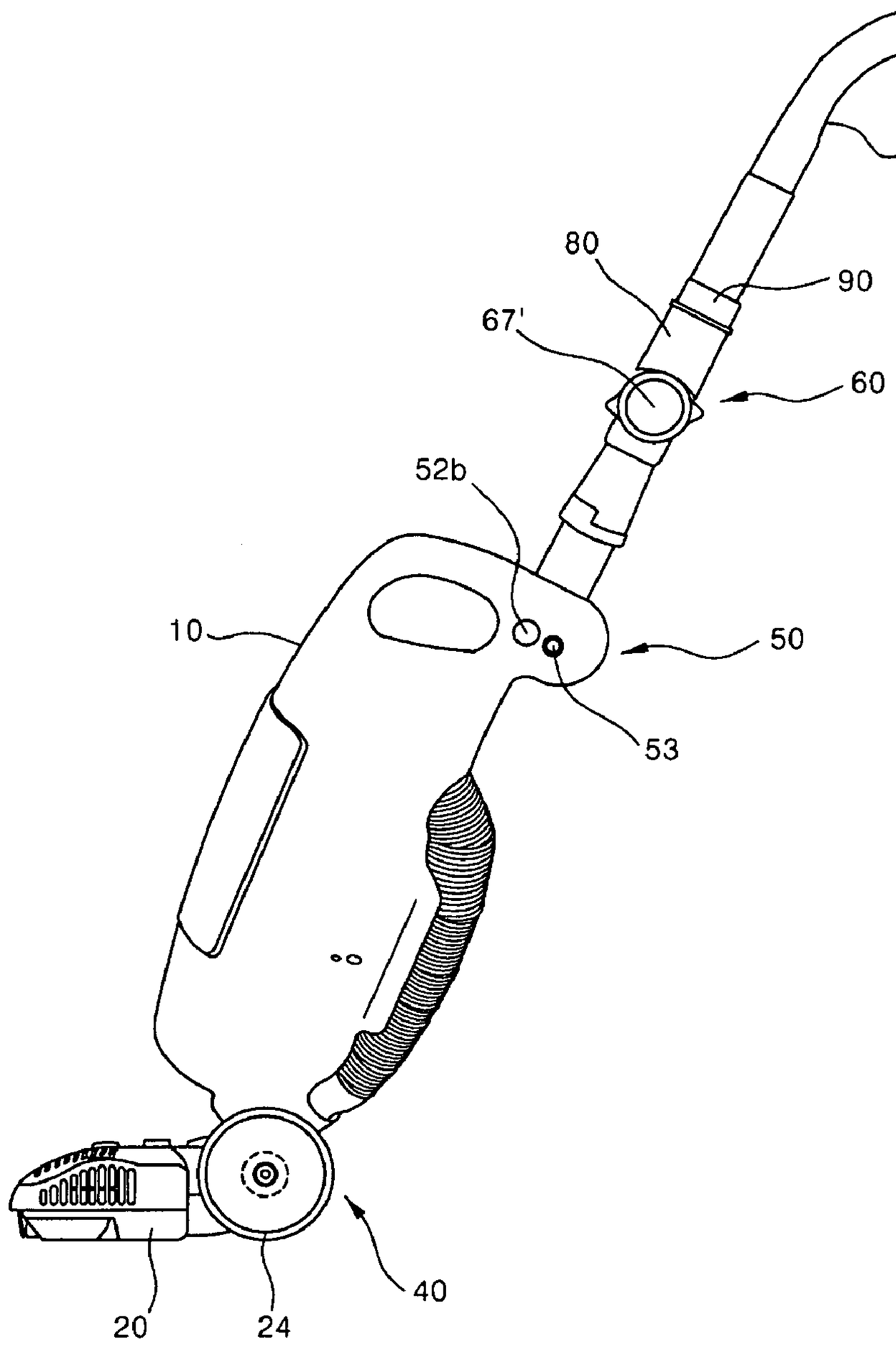


FIG. 6c

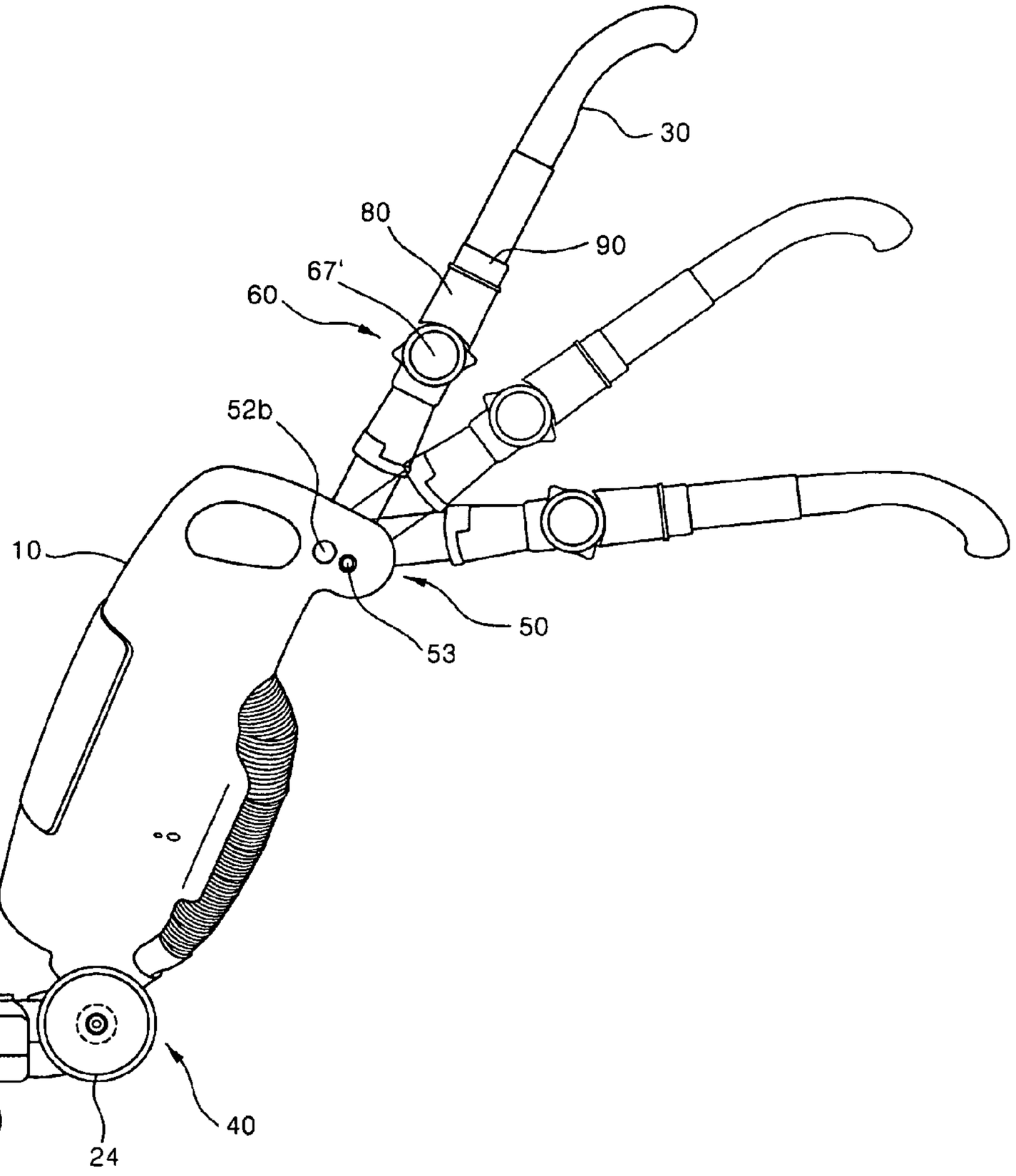


FIG. 6d

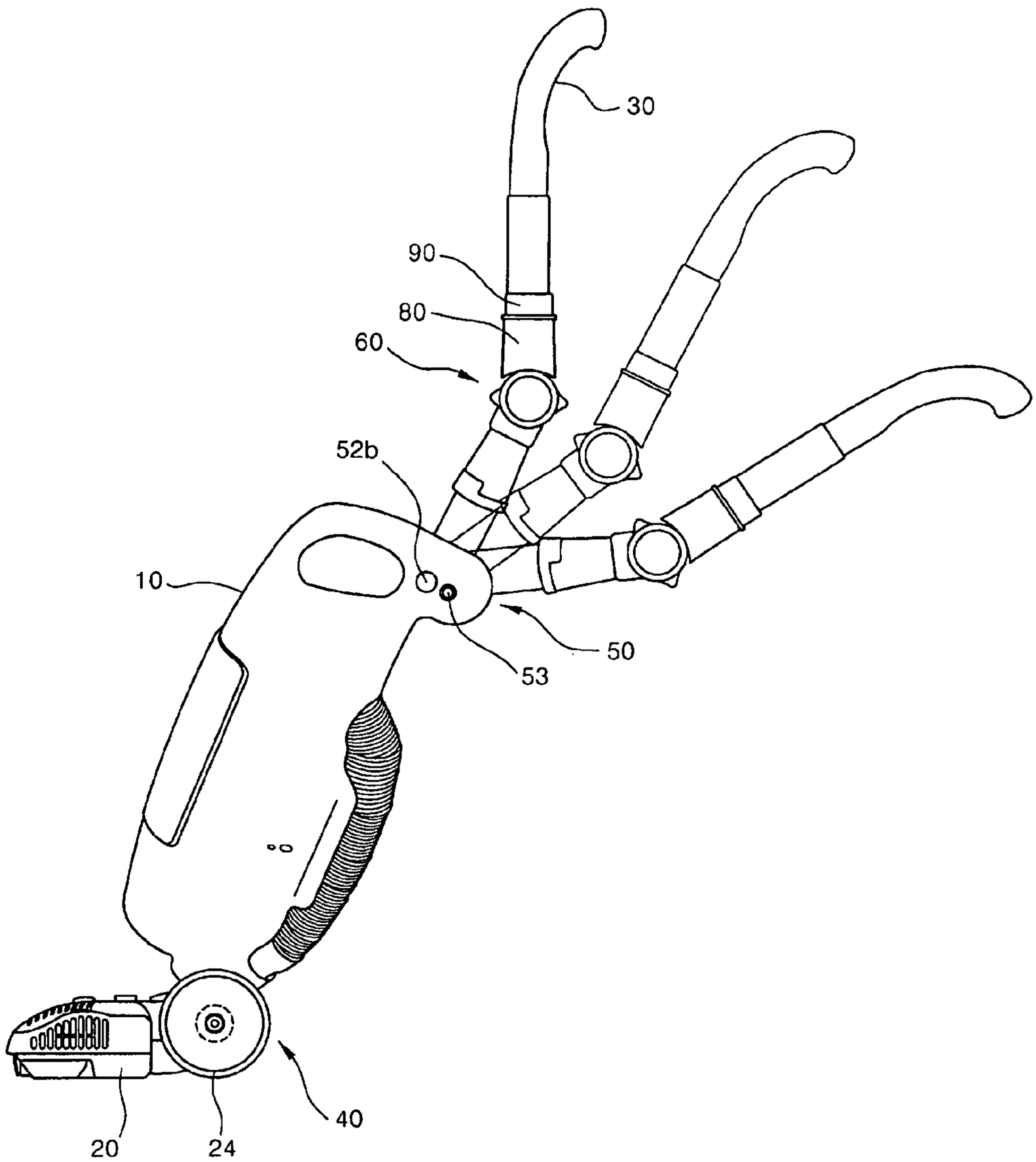
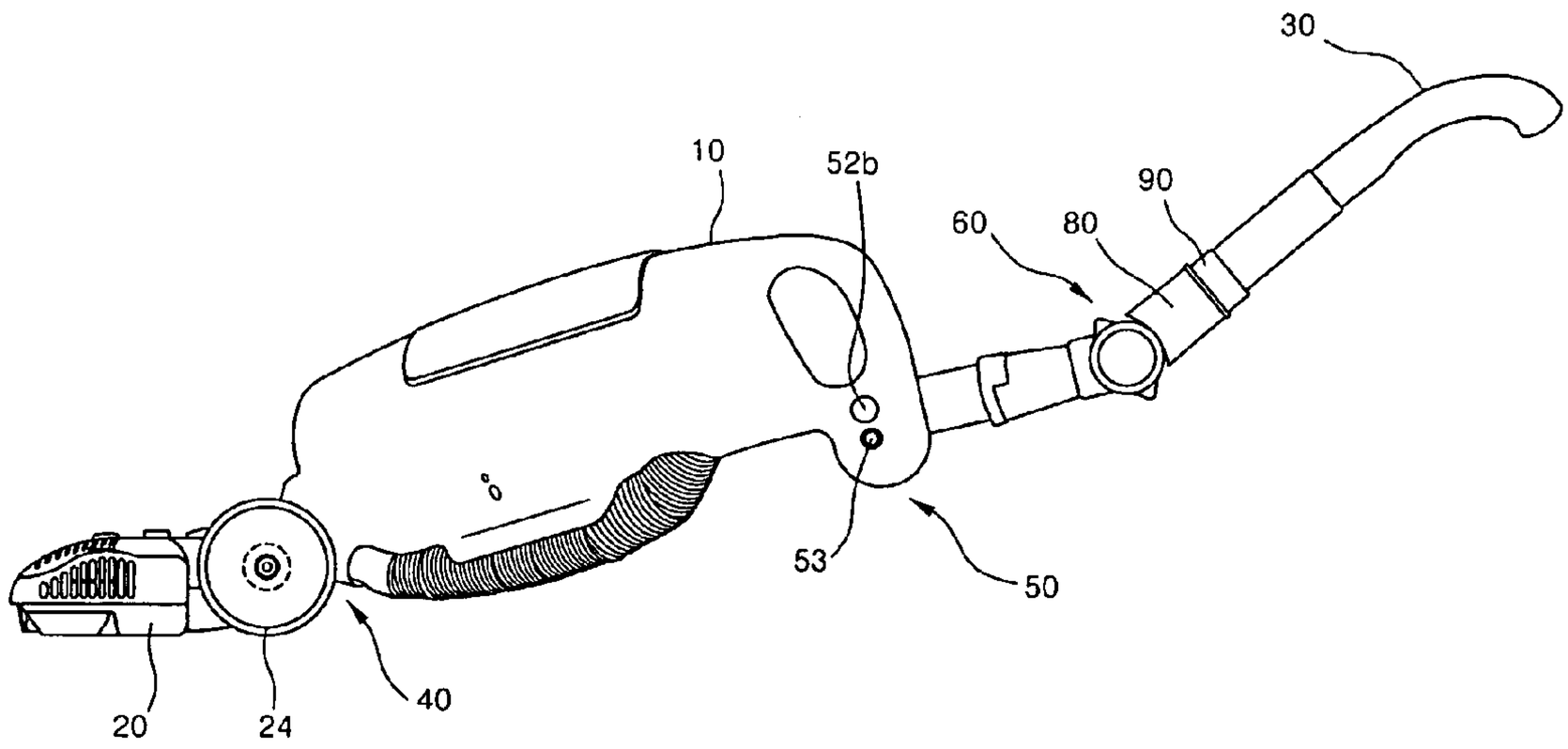


FIG. 6e



UPRIGHT TYPE VACUUM CLEANER HAVING MULTI JOINT PORTION

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to an upright type vacuum cleaner, and more particularly, to an upright type vacuum cleaner, wherein a nozzle unit, a main body and a handle can be used in various configurations and at different angles.

2. Description of the Related Art

FIG. **1** is a rear perspective view showing the structure of a conventional upright type vacuum cleaner. Referring to FIG. **1**, the upright type vacuum cleaner roughly comprises a main body **1**, a suction nozzle unit **3** and a handle **5**. The main body **1** contains a motor for generating suction force sucking foreign materials such as dust, and a filtering means for filtering out the foreign materials entrained in sucked air. A switch **2** is provided at a side of an outer surface of the main body **1** to turn on or off the motor.

The suction nozzle unit **3** is connected to the main body **1** so that the suction nozzle unit can pivot on a shaft with respect to the main body **1** in a predetermined angular range. Accordingly, when not in use, as shown in FIG. **1**, the main body **1** maintains an upright state with respect to the suction nozzle unit **3**. When in use, the main body **1** is inclined at a certain angle with respect to the suction nozzle unit **3** seated on a place to be cleaned. Here, in order to release the main body **1** from the upright state with respect to the suction nozzle unit **3**, a releasing pedal **3'** is provided at a rear end of the suction nozzle unit **3**.

Meanwhile, the suction nozzle unit **3** serves to suck foreign materials existing on the place to be cleaned together with air. To this end, a suction inlet is formed in a bottom face of the suction nozzle unit **3**. The suction inlet communicates with the motor in the main body **1** through a connecting hose **4**.

The handle **5** is formed to be elongated at an upper end of the main body **1**. When in use, the handle is grasped by a user. The handle **5** is formed integrally with the main body **1**.

The suction nozzle unit **3** is provided with wheels **7** for allowing the suction nozzle unit to smoothly move. In addition to the wheels **7**, of course, it is preferred that a separate roller be provided on the bottom face of the suction nozzle unit **3**. In the figure, reference numeral **9** designates a power cord.

The conventional upright type vacuum cleaner constructed as above is kept in a state where the main body **1** is stood upright with respect to the suction nozzle unit **3** as shown in FIG. **1**. When in use, a locking state between the main body **1** and the suction nozzle unit **3** is released by pressing the releasing pedal **3'**. Thereafter, the user grasps the handle **5** and can move the suction nozzle unit **3** in a state where the main body **1** is inclined at a certain angle with respect to the suction nozzle unit **3**.

When the user then turns on the switch **2** to operate the motor, foreign materials such as dust existing on a place to be cleaned are sucked together with air through the suction inlet of the suction nozzle unit **3** by means of the suction force. The foreign materials and air are sucked through the connecting hose **4** and pass through the filtering means mounted in the main body **1** to filter out the foreign materials. The air from which the foreign materials are filtered out is discharged to the outside of the main body **1**.

The conventional vacuum cleaner described above has problems as follows.

That is, in the conventional upright type vacuum cleaner, since the main body **1** can freely pivot at certain angles with respect to the suction nozzle unit **3**, the user can perform cleaning work while maintaining an angle formed between the main body and the suction nozzle unit according to the user's physique. However, in a case where the user intends to insert the suction nozzle unit **3** into a place under furniture, particularly, into a farthest place under the furniture, the main body **1** should be significantly lowered and thus the user should considerably bend his/her back.

With such a structure in which only the main body **1** pivots with respect to the suction nozzle unit **3** at certain angles, there is a problem in that users having different physiques cannot conveniently use the vacuum cleaner under various conditions.

Further, since the handle **5** extends upward from the main body **1** and the vacuum cleaner **1** should be kept in a state where the main body maintains an upright state with respect to the suction nozzle unit **3**, there is a problem in that an overall height of the vacuum cleaner is excessively large, thereby increasing a space required for keeping the vacuum cleaner.

SUMMARY OF THE INVENTION

Accordingly, the present invention is conceived to solve the problems in the prior art. An object of the present invention is to provide an upright type vacuum cleaner, wherein a nozzle unit, a main body and a handle can be used in various configurations and at different angles.

Another object of the present invention is to provide an upright type vacuum cleaner of which the length and shape can be adjusted according to various physical conditions of users.

A further object of the present invention is to provide an upright type vacuum cleaner, wherein a space required for keeping the vacuum cleaner can be minimized.

According to an aspect of the present invention for achieving the objects, there is provided an upright type vacuum cleaner, comprising a main body with a filtering means for filtering out foreign materials entrained in sucked air; a suction nozzle unit connected to a lower portion of the main body to be pivoted on a first joint portion, so as to suck the air with the entrained foreign materials and guide the sucked air into the main body; a suction force generating means installed at one of the main body and the suction nozzle unit to generate suction force for sucking the air with the entrained foreign materials; and a handle that is connected to the main body to be pivoted on a second joint portion, provided with a third joint portion in the handle so that the handle can be folded at certain angles, and grasped by a user in use.

The first joint portion may be constructed such that the main body and the suction nozzle unit mutually rotate about a first rotational shaft extending in a direction perpendicular to a traveling direction of the suction nozzle unit.

The second joint portion may comprise a connecting piece formed at one of the main body and the handle; a connecting disk formed at the other of the main body and the handle and pivotably connected to the connecting piece; a second rotational shaft simultaneously passing through the connecting piece and the connecting disk to act as the center of relative rotation of the connecting piece and the connecting disk; and a locking means for maintaining a state where the connecting disk has been rotated with respect to the connecting piece.

A pair of connecting pieces may be formed at a predetermined interval.

The locking means may comprise a locking button provided on a side surface of the connecting disk and subjected to elastic force so that the locking button can protrude outward; a fastening bracket that has side plate portions facing both side surfaces of the connecting disk, and a locking button hole in which the locking button is selectively seated, and is fastened between the connecting pieces; and a release button seated in a release button hole formed at a position on the connecting piece corresponding to the locking button hole such that the locking button escapes from the locking button hole when the user presses the release button.

A plurality of locking buttons may be provided at a predetermined angular interval to maintain the second joint portion at different angles.

The third joint portion may comprise a first connecting tube defining a portion of the handle; a second connecting tube that defines a portion of the handle and is connected to the first connecting tube so that it can relatively pivot with respect to the first connecting tube at certain angles; and a locking member for maintaining a state where the second connecting tube has been relatively pivoted with respect to the first connecting tube.

Corresponding ends of the first and second connecting tubes may be provided with a cylindrical connecting/receiving portion and a rotating/connecting portion rotatably received in the connecting/receiving portion, respectively, whereby the second connecting tube is relatively pivoted with respect to the first connecting tube.

The rotating/connecting portion may be formed with a through-hole to communicate with the interiors of the first and second connecting tubes.

The vacuum cleaner may further comprise a joint cover that covers the connecting/receiving portion of the first connecting tube and the rotating/connecting portion of the second connecting tube, and is fixed to one of the first and second connecting tubes.

The locking member may comprise a cylindrical portion in the form of a ring and a skirt portion extending and flaring from the cylindrical portion, and the skirt portion may have locking ribs formed on an inner surface thereof. The locking ribs are fastened to a catching projection provided at one of the first and second connecting tubes at which the locking member is not installed.

The locking member may be urged by an elastic member in a direction in which the locking member is caught by the locking projection, and one end of the elastic member may be supported in cylindrical portion and the other end thereof may be supported by a supporting stopper mounted on an outer circumferential surface of the other of the first and second connecting tubes at which the locking member is installed.

The second and third joint portions may be locked such that the main body and the handle are in a straight line.

According to another aspect of the present invention, there is provided an upright type vacuum cleaner, comprising a suction nozzle unit having a suction inlet in a bottom face thereof to suck air with entrained foreign materials; a main body that is rotatably connected to the suction nozzle unit through a first joint portion such that an obtuse angle is formed between the main body and an upper surface of the suction nozzle unit, and provided with a filtering means for filtering out the foreign materials entrained in the sucked air; a suction force generating portion installed at one of the main body and the suction nozzle unit to generate suction force for sucking the air and the foreign materials; and a handle that is connected to an upper portion of the main body to be pivoted on a second joint portion between a location at which the handle extends from the main body in a straight line and another location at which the handle comes into contact with the main body, provided with a third joint portion in the middle thereof to enable an upper portion of the handle to pivot on the third joint portion with respect to a lower portion thereof in a direction opposite to the pivoting direction of the handle toward the main body, and grasped by a user in use.

According to another aspect of the present invention, there is provided an upright type vacuum cleaner, comprising a main body with a filtering means for filtering out foreign materials entrained in sucked air; a suction nozzle unit connected to a lower portion of the main body to be pivoted on a first joint portion, so as to suck the air with the entrained foreign materials and guide the sucked air into the main body; a suction force generating means installed at one of the main body and the suction nozzle unit to generate suction force for sucking the air with the entrained foreign materials; and a handle connected to the main body to be pivoted on a second joint portion, the handle have prominence and depression which is preventing hand from slipping in a region grasped by a user.

According to the upright type vacuum cleaner of the present invention constructed as above, users having various physiques can conveniently use the vacuum cleaner by adjusting the main body, the suction nozzle unit and the handle in various configurations.

BRIEF DESCRIPTION OF THE DRAWINGS

The above and other objects, features and advantages of the present invention will become apparent from the following description of a preferred embodiment in conjunction with the accompanying drawings, in which:

FIG. **1** is a rear perspective view showing the structure of a conventional upright type vacuum cleaner;

FIG. **2** is a perspective view showing the structure of an upright vacuum cleaner according to a preferred embodiment of the present invention;

FIG. **3** is a side view showing the structure of the upright vacuum cleaner of the present invention;

FIG. **4** is an exploded perspective view showing the structure of a second joint portion of the upright vacuum cleaner of the present invention;

FIG. **5** is an exploded perspective view showing the structure of a third joint portion of the upright vacuum cleaner of the present invention; and

FIGS. **6***a* to **6***e* are views showing states where the upright vacuum cleaner of the present invention is used.

DETAILED DESCRIPTION OF THE INVENTION

Hereinafter, an upright vacuum cleaner according to a preferred embodiment of the present invention will be described in detail with reference to accompanying drawings.

As shown in the figures, the upright type vacuum cleaner of the present invention comprises a main body **10**, a suction nozzle unit **20** and a handle **30**. The main body **10**, the suction nozzle unit **20** and the handle **30** are connected through three joint portions **40**, **50** and **60** so that they can be arranged at different angles and then used.

First, the main body **10** contains a motor (not shown) for generating suction force, and a filtering means for filtering out and collecting foreign materials entrained in air sucked by means of the suction force generated by the motor. Of course, the motor is not necessarily contained in the main body **10** but may be provided in the suction nozzle unit **20**.

The suction nozzle unit **20** has a suction inlet (not shown) formed in a bottom face thereof to face a place to be cleaned. The suction inlet communicates with the motor in the main body **10** through a connecting hose **22**. Therefore, air and the foreign materials are sucked through the suction inlet by means of the suction force generated by the motor and transferred to the filtering means through the connecting hose **22**.

The suction nozzle unit **20** is provided with moving wheels **24** for allowing the suction nozzle unit to smoothly move. The wheels **24** are provided at a relatively rear end of the section nozzle unit **20**. In addition, at least one roller is provided on the bottom face of the suction nozzle unit **20** to allow the section nozzle unit **20** to more smoothly move.

The handle **30** is formed to be elongated at an upper end of the main body **10**. When in use, the handle is grasped by a user. A region grasped by a user of the handle **30** may be knurled to improve the user's grip. Further, the region grasped by a user of the handle **30** may have a prominence and depression portion **30'**, as shown in FIG. **3** that correspond to a user's hand. The prominence and depression portion **30'** prevents a hand from slipping in a region grasped by a user.

The handle **30** may be folded about the second joint portion **50** at certain angles with respect to the main body **10**, and at the same time, about the third joint portion **60** in the middle of the handle at certain angles. The handle **30** may be provided with a switch **32** for turning on or off the vacuum cleaner.

Meanwhile, the main body **10** and the suction nozzle unit **20** are connected to each other through the first joint portion **40**. The first joint portion **40** is constructed such that the main body **10** can rotate at certain angles with respect to the suction nozzle unit **20**. For example, the first joint portion **40** is provided with a first rotational shaft **42** at a side of a lower end of the main body **10** to extend in a direction perpendicular to a traveling direction of the suction nozzle unit **20**, and both ends of the rotating shaft **42** is rotatably mounted at the suction nozzle unit **20**.

Next, the structure of the second joint portion **50** for connecting the handle **30** to the main body **10** will be described. Connecting pieces **51** spaced apart at a predetermined interval from each other are provided at the upper end of the main body **10**. A space defined between the connecting pieces **51** is a connecting slot **51'** in which a connecting disk **56** to be described later is installed rotatably. Shaft holes **51***h* are formed in the both connecting pieces **51**.

One of the connecting pieces **51** has a release button hole **52** formed at a side of an outer surface of the connecting piece adjacent to the relevant shaft hole **51***h*. A cylindrical guide rib **52'** is formed on an inner surface of the release button hole **52** such that an inner diameter of the guide rib **52'** is somewhat larger than that of the release button hole **52**.

A release button **52***b* is placed in the release button hole **52**. The release button **52** serves to press a locking button **57** or **57'** to be described later to release a locking state. A flange **52***f* is formed along an outer circumferential surface of a rear end of the release button **52***b*. The flange **52***f* is formed such that its diameter substantially conforms to the inner diameter of the guide rib **52'**. Therefore, the flange **52***f* is caught by an inner edge of the release button hole **52** to prevent the release button **52***b* from escaping from the release button hole **52**.

A release protrusion **52***t* is formed to protrude rearward from a rear end surface of the release button **52***b*. The release protrusion **52***t* comes into contact with and then presses the locking button **57** or **57'** to be described later. The release button **52***b* is supported by a spring **52***s* that always urges the release button outward.

A central shaft **53** is installed to pass through the shaft holes **51** of the connecting pieces **51**. The central shaft **53** does not actually rotate and acts as the center of rotation of the connecting disk **56** to be described later.

A fastening bracket **54** is provided within the connecting slot **51'**. The fastening bracket **54** is provided with side plate portions **54'** that will be placed inside of the respective connecting pieces **51**. The side plate portions **54'** are spaced apart from each other with a gap corresponding to the width of the connecting slot **51'** but connected to each other at one ends thereof. Each of the side plate portions **54'** has a shaft hole **54***h* that is concentric with the shaft hole **51***h*.

One of the side plate portions **54'** is formed with a locking button hole **55** at a position corresponding to the release button hole **52**. The release protrusion **52***t* of the release button **52** comes into contact with the locking button **57** or **57'** through the locking button hole **55**. The locking button hole **55** also has a guide rib **55***r* formed therearound. An inner circumferential surface of the spring **52***s* is seated on an outer circumferential surface of the guide rib **55***r*.

The connecting disk **56** is provided at one end of the handle **30**. The connecting disk **56** is inserted into the connecting slot **51'** and has a shaft hole **56***h* formed therethrough at the center thereof. The central shaft **53** is received in the shaft hole **56***h*. That is, the central shaft **53** passes through the shaft hole **56***h* of the connecting disk **56** and the shaft hole **54***h* of the fastening bracket **54** and both ends of the central shaft are received in and supported by the shaft holes **51** of the connecting pieces **51**.

The connecting disk **56** has the locking buttons **57** and **57'**. The locking buttons **57** and **57'** are supported by a spring (not shown) that urges the locking buttons to protrude beyond an outer surface of the connecting disk **56**. Accordingly, the locking buttons **57** and **57'** always protrude beyond the outer surface of the connecting disk **56** by a predetermined height. When the connecting disk **56** is rotated, the locking button hole **55** is located on a moving path of the locking buttons **57** and **57'**.

In this embodiment, the locking buttons **57** and **57'** are located at an angular interval of 180 degrees around the shaft hole **56***h*. However, a plurality of locking buttons should be provided in order to fix the handle **30** at different angles with respect to the main body **10**. Since the two locking buttons **57** and **57'** are provided in this embodiment, one of the locking buttons **57** and **57'** is locked in the locking button hole **55** in a state of FIG. **2** where the handle **30** is in alignment with the main body **10**. In a state where the handle **30** is folded to lie on the back of the main body **10**, the other of the locking buttons **57** and **57'** is locked in the locking button hole **55**.

Next, the structure of the third joint portion **60** will be described with reference to FIG. **5**. The third joint portion **60** allows the handle itself **30** to be folded at certain angles. To this end, a first connecting tube **61** connected to the connecting disk **56** is provided. A connecting/receiving portion **61'** is formed at an upper end of the first connecting tube **61**. The connecting/receiving portion **61'** generally takes the

shape of a cylinder of which a portion is cut away in a longitudinal direction thereof.

An escape preventing piece **62** is formed at the connecting/receiving portion **61'** to encompass a portion of a rotating body **72** to be described later. The escape preventing piece **62** forms a part of the cylindrical connecting/receiving portion **61'**. A guide groove for guiding a side of the rotating body **72** is formed in a disk-shaped sidewall **63** which defines a side of the connecting/receiving portion **61'**.

The connecting/receiving portion **61'** has a generally linear supporting end **64** formed at a side opposite to the escape preventing piece **62**, and a circular supporting end **64'** is formed on the side of the escape preventing piece **62**. These supporting ends **64** and **64'** regulates a range of rotation of a rotating/connecting portion **71** to be described later.

Connecting pieces **65** protrude from an outer surface of the connecting/receiving portion **61'** in the vicinity of the circular supporting end **64'**. A through-hole is formed through each connecting piece **65**. A through-hole **66** is formed through the first connecting tube **61**. For example, a power cable goes through the through-hole **66**. Reference numeral **66'** designates an assembling recess, and reference numeral **66***s* designates a step formed on an outer surface of the first connecting tube **61**.

Joint covers **67** and **67'** define an external appearance of the third joint portion **60**. The joint covers **67** and **67'** are formed to be substantially symmetric and coupled with each other by means of screws S. Each of the joint covers **67** and **67'** has a circular side cap **67***c*. The side caps **67***c* correspond to the center of rotation of the third joint portion **60**.

A binding portion **68** encompassing the first connecting tube **61** is formed at a side of each of the joint covers **67** and **67'**. The binding portions **68** of the joint covers **67** and **67'** are coupled to encompass a portion of the first connecting tube **61** between the connecting/receiving portion **61** and the step **66***s*.

For the coupling of the binding portions **68** to each other, hooking ribs **68'** and seating recesses **68"** are provided at corresponding positions, respectively. A portion of each hooking rib **68'** protruding toward the interior of the binding portion **68** is seated in the relevant seating recess **68"**. A catching projection **69** is formed at each of the joint covers **67** and **67'**. The catching projections **69** are provided for fastening with a locking member **80** to be described later.

To ensure the coupling of the joint covers **67** and **67'**, fastening ribs **69'** are formed at positions corresponding to each other. Two fastening ribs **69'** are formed at each of the joint covers **67** and **67'**. A fastening hole **69***h* is formed to penetrate through each fastening rib **69'**. For reference, each connecting piece **65** is placed between the relevant two fastening ribs **69'**, and a fastening screw S passes through the fastening holes **69***h* of the fastening ribs **69'** and the through-hole of the connecting piece **65**.

A second connecting tube **70** is rotatably connected to the first connecting tube **61**. A rotating/connecting portion **71** is formed at a lower end of the second connecting tube **70**. The rotating/connecting portion **71** is rotatably received in the connecting/receiving portion **61'** and generally takes the shape of a cylinder. Circular ribs **72'** in the form of a ring are formed at both ends of the rotating/connecting portion **71** so that the rotation of the rotating/connecting portion can be guided along the guide grooves of the side caps **67***c*.

The rotating/connecting **71** is also provided with a through-hole **73** that communicates with the interior of the second connecting tube **70**. Accordingly, the interiors of the first and second connecting tubes **61** and **70** communicate with each other though the through-hole **73** and the power cable and the like can go through them.

A locking projection **74** for fastening with the locking member **80** is formed on an outer circumferential surface of the second connecting tube **70**. An auxiliary projection **74'** is formed on the outer circumferential surface of the second connecting tube **70** to extend from the locking projection **74** in a longitudinal direction of the second connecting tube **70**. Further, a fixing rib **75** is formed on the outer circumferential surface of the second connecting tube **70**. The fixing rib **75** is to fix a supporting stopper **90** to be described later.

The locking member **80** surrounds the outer circumferential surface of the second connecting tube **70** and is coupled selectively with the first connecting tube **61**, more specifically, the joint covers **67** and **67'** to ensure a coupled state of the third joint portion **60**. The locking member **80** comprises a cylindrical portion **81** in the form of a ring having an inner diameter larger than an outer diameter of the second connecting tube **70**, and a skirt portion **83** that flares from the cylindrical portion **81** toward a lower end of the locking member. The skirt portion **83** is formed to gradually flare toward the lower end of the locking member, and the locking member has different lengths from the cylindrical portion **81** to the lower end of the locking member according to positions in order to prevent the skirt portion from interfering with the joint covers **67** and **67'**.

Supporting projections **84** are formed on an inner circumferential surface of the cylindrical portion **81** in the vicinity of the skirt portion **83**. The supporting projections **84** are formed along the inner circumferential surface of the cylinder portion **81** to support an end of an elastic member **88** to be described later.

A plurality of spacer ribs **85** are formed on an inner surface of the skirt portion **83**. The spacer ribs **85** are to enable relative reduction in a space between the inner surface of the skirt portion **83** and the outer circumferential surface of the second connecting tube **70**. Accordingly, the height of the spacer ribs **85** increases gradually toward the end of the skirt portion **83**.

The inner circumferential surface of the skirt portion **83** is formed with a pair of locking ribs **86** in a longitudinal direction of the skirt portion **83**. The locking ribs **86** are formed parallel to each other with an interval corresponding to the width of the locking projection **74**. A pair of auxiliary locking ribs **87** are formed at a position on the inner circumferential surface of the skirt portion that is close to the cylindrical portion **81** and falls within the width of the locking projections **74**. The auxiliary locking ribs **87** are formed parallel to each other with an interval corresponding to the width of the auxiliary projection **74'**.

The elastic member **88** is provided between the inner circumferential surface of the cylindrical portion **81** and the outer circumferential surface of the second connecting tube **70**. The elastic member **88** exerts elastic force in a direction in which the locking member **80** is hung over the joint covers **67** and **67'**.

The supporting stopper **90** supports the other end of the elastic member **88** of which one end is supported on the locking member **80**. The supporting stopper **90** takes the shape of a ring and is installed to surround the outer circumferential surface of the second connecting tube **70**. A restricting projection **92** is formed at a side of the supporting stopper **90** to prevent the locking member **80** from being moved beyond the supporting stopper **90**. Of course, since the elastic member **88** is supported by the supporting stopper **90**, the locking member **80** is further prevented from being moved toward the supporting stopper **90** beyond a predetermined range.

A fixing recess **93** is formed on an inner surface of the supporting stopper **90**. The fixing rib **75** is seated in the fixing recess **93** so that the supporting stopper **90** is fixed to the second connecting tube **70**. An insertion groove **94**

serving as a path through which the fixing rib **75** is inserted into the fixing recess **93** is formed on the inner surface of the supporting stopper **90**. The insertion groove **94** is originated at an end of the supporting stopper which is opposite to the fixing recess **93** and then communicates with the fixing recess **93**. The fixing recess **93** is open toward the other end of the supporting stopper which is opposite to the end thereof supporting the elastic member **88**.

Hereinafter, the operation of the upright type vacuum cleaner according to the present invention constructed as above will be described in detail.

FIGS. **6***a* to **6***e* show various states where the vacuum cleaner of the present invention is used. First, FIG. **6***a* shows a state where the vacuum cleaner of the present invention is in safekeeping. At this time, the main body **10** is stood upright with respect to the suction nozzle unit **20**, and the handle **30** is folded back toward the main body **10**.

Next, FIG. **6***b* shows a state where the handle **30** is unfolded so that the handle **30** and the main body **10** are in a straight line. At this time, the main body **10** is pivoted on the first joint portion **40** at a certain angle with respect to the suction nozzle unit **20**. The locking button **57** is received in the locking button hole **55** so that the handle **30** is in a locked state. This state corresponds to a case where a relatively tall user cleans an open place to be cleaned.

FIG. **6***c* shows a state where the handle **30** is pivoted on the second joint portion **50** at certain angles with respect to the main body **10**. That, if the release button **52***b* is pressed in the state shown in FIG. **6***b*, the release protrusion **52***t* presses the locking button **57** received in the locking button hole **55** through the release button hole **52**. Accordingly, the locking button **57** escapes from the locking button hole **55**, and the fastened state of the connecting disk **56** and the fastening bracket **54** is released. For reference, the locking buttons **57** and **57'** which are not received in the locking button hole **55** are pressed by the side plate portion **54'** of the fastening bracket **54** and remain within the connecting disk **56**.

Therefore, the handle **30** can be freely pivoted on the second joint portion **50** with respect to the main body **10**. Of course, if the number of the locking buttons **57** and **57'** is increased, the handle **30** can be fixed at different angles with respect to the main body **10**.

Meanwhile, if force applied by a user is removed, the release button **52***b* protrudes to the exterior of the connecting piece **51** through the release button hole **52** by means of restoring force of the spring **52***s*. The release button **52** does not escape from the release button hole **52** due to the flange **52***f*.

Next, the pivoting of the handle **30** at different angles on the third joint portion **60** provided in the handle **30** will be described. FIG. **6***d* shows a state where the handle **30** is pivoted on the third joint portion **60**.

Prior to description of the operation of the third joint portion **60**, a state where the third joint portion **60** is assembled will be first described. In a state where the first connecting tube **61** and the second connecting tube **70** are in a straight line, the locking member **80** is pushed toward the joint covers **67** and **67'** by means of elastic force of the elastic member **88**. Accordingly, the locking projection **74** and the catching projection **69** are located between the locking ribs **86**, and the auxiliary projection **74'** is inserted between the auxiliary locking ribs **87**. In this state, the locking member **80** located around the second connecting tube **70** is fastened to the joint covers **67** and **67'** on the first connecting tube **61** so that the second connecting tube **70** cannot relatively rotate with respect to the first connecting tube **61**.

In order to ensure the occurrence of pivoting on the third joint portion **60**, the locking member **80** should be moved along the second connecting tube **70** toward the supporting stopper **90**. That is, when the locking member **80** is moved while overcoming the elastic force of the elastic member **88**, the locking ribs **86** of the locking member **80** are released from the catching projection **69** and the auxiliary locking ribs **87** are released from the auxiliary projection **74'** so that the first connecting tube **61** can be relatively pivoted with respect to the second connecting tube **70**. That is, the rotating/connecting portion **71** can be relatively rotated within the connecting/receiving portion **61'**.

For reference, in order to allow the third joint portion **60** to fix the second connecting tube **70** to the first connecting tube **61** as shown in FIG. **6***d*, an additional catching projection **69** may be further provided. That is, the additional catching projection **69** is formed at a position on the joint cover **67** that corresponds to the locking ribs **86** of the skirt portion **83** in the state shown in FIG. **6***d*.

Meanwhile, in the embodiment of the present invention, if the user causes the main body **10** to be closest to a floor and the second connecting tube **70** to be maximally pivoted on the third joint portion **60** as shown in FIG. **6***e*, the user can move the suction nozzle unit **20** to a farthest inner position through a narrow gap. For example, the user can move the suction nozzle unit **20** to a farthest inner position through a gap between the floor and furniture.

If the second connecting tube **70** that has been folded with respect to the first connecting tube **61** is then unfolded to be in line with the first connecting tube **61**, the locking member **80** is moved toward the joint covers **67** and **67'** by the elastic force of the elastic member **88**. Therefore, the locking member **80** is fastened to the joint covers **67** and **67'** by means of the locking ribs **86** and the catching projection **69**.

The scope of the present invention is not limited to the embodiment described above but defined only by the appended claims. It is obvious that those skilled in the art can make various changes and modifications thereto without departing from the scope of the present invention defined by the claims.

For example, the first to third joint portions **40**, **50** and **60** may have structures different from those of the embodiment described and illustrated above. That is, an additional shaft perpendicular to the first rotational shaft **42** of the first joint portion **30** may be provided and the main body **10** may be constructed to rotate about the additional shaft.

As for the second joint portion **50**, a plurality of locking buttons may be provided so that the second joint portion **50** can be fixed at different angles, and the connecting pieces **51** and the connecting disk **56** may be provided at mutually opposite positions contrary to the embodiment.

As for the third joint portion **60**, the connecting/receiving portion **61'** may be formed at the second connecting tube **70**, and the rotating/connecting portion **71** may be formed at the first connecting tube **61**. Further, a plurality of catching projections **69** for fastening the locking member **80** to the joint covers **67** and **67'** may be provided.

According to the upright type vacuum cleaner of the present invention specifically described above, the following advantages can be obtained.

Since the main body, the suction nozzle unit and the handle constituting the vacuum cleaner of the present invention are connected to one another through three joint portions, they can be arranged in various configurations and at different angles. Accordingly, there is an advantage in that users can conveniently use the vacuum cleaner according to users' physical conditions and environments of places to be cleaned.

Further, since the vacuum cleaner of the present invention has relatively many joint portions, there is an advantage in

that the vacuum cleaner can be folded to a minimum size for safekeeping so that a space required for keeping the vacuum cleaner can be minimized.

What is claimed is:

1. An upright type vacuum cleaner, comprising:

a main body with a filtering device that filters out foreign materials entrained in sucked air;

a suction nozzle device connected to a lower portion of the main body to be pivoted on a first joint portion;

a suction force generating device mounted in one of the main body and the suction nozzle device to generate suction force for sucking the air with the entrained foreign materials; and

a handle connected to the main body to be pivoted on a second joint portion, and provided with a third joint portion in the handle so that the handle can be folded at certain angles, wherein the handle is configured to be grasped by a user in use, and wherein the second joint portion comprises:

a connecting piece formed on one of the main body and the handle;

a connecting disk formed on the other of the main body and the handle and pivotably connected to the connecting piece;

a second rotational shaft simultaneously passing through the connecting piece and the connecting disk to act as a center of relative rotation of the connecting piece and the connecting disk; and

a locking device that maintains a state in which the connecting disk has been rotated with respect to the connecting piece.

2. The upright type vacuum cleaner as claimed in claim **1**, wherein the first joint portion is constructed such that the main body and the suction nozzle device mutually rotate about a first rotational shaft extending in a direction perpendicular to a traveling direction of the suction nozzle device.

3. The upright type vacuum cleaner as claimed in claim **2**, wherein a pair of connecting pieces are formed at a predetermined interval.

4. The upright type vacuum cleaner as claimed in claim **1**, wherein the locking device comprises:

a locking button provided on a side surface of the connecting disk and subjected to elastic force so that the locking button can protrude outward;

a fastening bracket having side plate portions facing both side surfaces of the connecting disk, and a locking button hole in which the locking button is selectively seated, the fastening bracket being fastened between the connecting pieces; and

a release button seated in a release button hole formed at a position on the connecting piece corresponding to the locking button hole such that the locking button escapes from the locking button hole when the user presses the release button.

5. The upright type vacuum cleaner as claimed in claim **4**, wherein a plurality of locking buttons are provided at a predetermined angular interval to maintain the second joint portion at different angles.

6. The upright type vacuum cleaner as claimed in claim **1**, wherein the third joint portion comprises:

a first connecting tube that defines a portion of the handle;

a second connecting tube that defines a portion of the handle, the second connecting tube being connected to the first connecting tube so as to relatively pivot with respect to the first connecting tube at certain angles; and

a locking member that maintains a state in which the second connecting tube has been relatively pivoted with respect to the first connecting tube.

7. The upright type vacuum cleaner as claimed in claim **6**, wherein corresponding ends of the first and second connecting tubes are provided with a cylindrical connecting/receiving portion and a rotating/connecting portion rotatably received in the connecting/receiving portion, respectively, whereby the second connecting tube is relatively pivoted with respect to the first connecting tube.

8. The upright type vacuum cleaner as claimed in claim **7**, wherein the rotating/connecting portion is formed with a through-hole to communicate with the interiors of the first and second connecting tubes.

9. The upright type vacuum cleaner as claimed in claim **7**, further comprising a joint cover that covers the connecting/receiving portion of the first connecting tube and the rotating/connecting portion of the second connecting tube, the joint cover being fixed to one of the first and second connecting tubes.

10. The upright type vacuum cleaner as claimed in claim **6**, wherein the locking member comprises a cylindrical portion in the form of a ring and a skirt portion extending and flaring from the cylindrical portion, and the skirt portion has locking ribs formed on an inner surface thereof, the locking ribs being fastened to a catching projection provided at one of the first and second connecting tubes at which the locking member is not installed.

11. The upright type vacuum cleaner as claimed in claim **10**, wherein the locking member is urged by an elastic member in a direction in which the locking member is caught by the catching projection, and one end of the elastic member is supported in cylindrical portion and the other end thereof is supported by a supporting stopper mounted on an outer circumferential surface of the other of the first and second connecting tubes at which the locking member is installed.

12. The upright type vacuum cleaner as claimed in claim **1**, wherein the second and third joint portions are locked such that the main body and the handle are in a straight line.

13. An upright type vacuum cleaner, comprising:

a suction nozzle device having a suction inlet in a bottom face thereof to suck air with entrained foreign materials;

a main body rotatably connected to the suction nozzle device through a first joint portion such that an obtuse angle is formed between the main body and an upper surface of the suction nozzle device, and provided with a filtering device that filters out the foreign materials entrained in the sucked air;

a suction force generating portion mounted in one of the main body and the suction nozzle device to generate suction force for sucking the air and the foreign materials; and

a handle connected to an upper portion of the main body to be pivoted on a second joint portion between a location at which the handle extends from the main body in a straight line and another location at which the handle comes into contact with the main body, the handle being provided with a third joint portion in the middle thereof to enable an upper portion of the handle to pivot on the third joint portion with respect to a lower portion thereof in a direction opposite to the pivoting direction of the handle toward the main body, wherein the handle is configured to be grasped by a user in use, and wherein the second joint portion comprises:

a connecting piece formed on one of the main body and the handle;

a connecting disk formed on the other of the main body and the handle and pivotably connected to the connecting piece;

a second rotational shaft simultaneously passing through the connecting piece and the connecting disk to act as a center of relative rotation of the connecting piece and the connecting disk; and

a locking device that maintains a state in which the connecting disk has been rotated with respect to the connecting piece.

14. An upright type vacuum cleaner, comprising:

a main body with a filtering device that filters out foreign materials entrained in sucked air;

a suction nozzle device connected to a lower portion of the main body to be pivoted on a first joint portion, so as to suck the air with the entrained foreign materials and guide the sucked air into the main body;

a suction force generating device mounted in one of the main body and the suction nozzle device to generate suction force for sucking the air with the entrained foreign materials; and

a handle connected to the main body to be pivoted on a second joint portion, wherein the handle has a prominence and depression portion that prevents a hand from slipping in a region grasped by a user, and wherein the second joint portion comprises:

a connecting piece formed on one of the main body and the handle;

a connecting disk formed on the other of the main body and the handle and pivotably connected to the connecting piece;

a second rotational shaft simultaneously passing through the connecting piece and the connecting disk to act as a center of relative rotation of the connecting piece and the connecting disk; and

a locking device that maintains a state in which the connecting disk has been rotated with respect to the connecting piece.

15. An upright type vacuum cleaner, comprising:

a main body with a filtering device that filters out foreign materials entrained in sucked air;

a suction nozzle device connected to a lower portion of the main body to be pivoted on a first joint portion;

a suction force generating device mounted in one of the main body and the suction nozzle device to generate suction force for sucking the air with the entrained foreign materials; and

a handle connected to the main body to be pivoted on a second joint portion, and provided with a third joint portion in the handle so that the handle can be folded at certain angles, wherein the handle is configured to be grasped by a user in use, and wherein the third joint portion comprises:

a first connecting tube that defines a portion of the handle;

a second connecting tube that defines a portion of the handle, the second connecting tube being connected to the first connecting tube so as to relatively pivot with respect to the first connecting tube at certain angles; and

a locking member that maintains a state in which the second connecting tube has been relatively pivoted with respect to the first connecting tube, wherein corresponding ends of the first and second connecting tubes are provided with a cylindrical connecting/receiving portion and a rotating/connecting portion rotatably received in the connecting/receiving portion, respectively, whereby the second connecting tube is relatively pivoted with respect to the first connecting tube.

16. The upright type vacuum cleaner as claimed in claim **15**, wherein the rotating/connecting portion is formed with a through-hole to communicate with the interiors of the first and second connecting tubes.

17. The upright type vacuum cleaner as claimed in claim **15**, further comprising a joint cover that covers the connecting/receiving portion of the first connecting tube and the rotating/connecting portion of the second connecting tube, the joint cover being fixed to one of the first and second connecting tubes.

18. An upright type vacuum cleaner, comprising:

a main body with a filtering device that filters out foreign materials entrained in sucked air;

a suction nozzle device connected to a lower portion of the main body to be pivoted on a first joint portion;

a suction force generating device mounted in one of the main body and the suction nozzle device to generate suction force for sucking the air with the entrained foreign materials; and

a handle connected to the main body to be pivoted on a second joint portion, and provided with a third joint portion in the handle so that the handle can be folded at certain angles, wherein the handle is configured to be grasped by a user in use, and wherein the third joint portion comprises:

a first connecting tube that defines a portion of the handle;

a second connecting tube that defines a portion of the handle, the second connecting tube being connected to the first connecting tube so as to relatively pivot with respect to the first connecting tube at certain angles; and

a locking member that maintains a state in which the second connecting tube has been relatively pivoted with respect to the first connecting tube, and wherein the locking member comprises a cylindrical portion in the form of a ring and a skirt portion extending and flaring from the cylindrical portion, and the skirt portion has locking ribs formed on an inner surface thereof, the locking ribs being fastened to a catching projection provided at one of the first and second connecting tubes at which the locking member is not installed.

19. The upright type vacuum cleaner as claimed in claim **18**, wherein the locking member is urged by an elastic member in a direction in which the locking member is caught by the catching projection, and one end of the elastic member is supported in cylindrical portion and the other end thereof is supported by a supporting stopper mounted on an outer circumferential surface of the other of the first and second connecting tubes at which the locking member is installed.

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